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PROCEEDINGS
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ROYAL GEOGRAPHICAL SOCIETY
AND MONTHLY RECORD OF GEOGRAPHY.

On the Athabasca District of the Canadian North-West Territory.

By the Rev. ÉMILE PETITOT.*

Map, p. 688.

SOME nine years ago, I wrote a short paper on the Fur District of Athabasca, which was inserted in the Bulletin of the French Geographical Society for July-September 1875, and was also twice published separately. My subsequent journeys on the Upper Athabasca river and a stay of some months on the lake of the same name, have enabled me to collect fresh topographical, statistical, and historical material on this great district of the Canadian North-west; so that I have had to recast my former account in order to interpolate these recent acquisitions as well as my personal observations.

It will be needless to refer to the works of the first explorers of the region, such as Hearne, Mackenzie, Franklin, Back, Richardson, and others, or even to the more recent 'Wild North Land' of Captain Butler, as the commercial district of Athabasca, which takes its name from the river and lake, has undergone so many modifications during the last decade. In 1879, the Hudson's Bay Company joined a considerable portion of the Lesser Slave Lake and Mackenzie districts to the old Athabasca district, and its boundaries were defined by the dismembered and modified Mackenzie district on the north, the Churchill district on the east, the English River on the south, the Upper Saskatchewan on the south-west, and British Columbia on the west.* From the Buffalo

* It should be observed that since M. Petitot's return to France, Athabasca has been re-defined as one of the four districts of the Prairie Section of the North-West Territories, by order of the Privy Council of Canada dated the 8th May, 1883, in the following words:—"4th. Athabasca. The district of Athabasca, about 122,000 square miles in extent, to be bounded on the south by the district of Alberta; on the east by the line between the 10th and 11th ranges of Dominion Lands townships before mentioned [i.e. the line dividing the 10th and 11th ranges of townships numbered from the fourth initial meridian of the Dominion Lands system of survey, or about $111^{\circ} 30'$ W. long.] until in proceeding northward that line intersects the Athabasca river; then by that river and the Athabasca Lake and Slave River to the intersection of the last with the

River, a southern affluent of the Great Slave Lake, the entire shore of that inland fresh-water sea up to and including the two Fonds-du-Lac on the east, belongs to this district; and Forts Resolution and Reliance, which are contained in it, are subordinate to Fort Chipewyan, the headquarters.

If a straight line be drawn from Fort Reliance (situated at the outlet of Artillery Lake, the mouth of the great river "Tpa-tché-gé-tchôp," whose current is as perceptible across Slave Lake as that of the Slave River) to the 105th meridian, and the latter followed to its intersection with the 61st parallel, the most easterly limit of the district is then defined. This imaginary line here meets a chain of crystalline rocks, belonging to the Laurentian system, which divides the basin of Hudson's Bay from that of the great interior lakes; and as this chain is the highest land in this region it serves as a natural boundary between the Athabasca district and the districts of the English River and Upper Saskatchewan. The Athabasca frontier leaves this chain a little to the east of La Biche (or Red-deer) Lake, and follows the 55th parallel to the Rocky Mountains, thus cutting the old district of the Lesser Slave Lake, in which Forts Assiniboine and Jasper are subordinate to Edmonton House, the headquarters of the Upper Saskatchewan. Then following northwards the great Cordillera, which is the natural western limit of the district, the frontier reaches beyond the Mountain River Portage, and comes again to the Great Slave Lake by a line passing between the nearly parallel courses of the Peace and Hay rivers.

The Athabasca district comprises two great rivers, and two great fresh-water basins. The rivers are the Athabasca (better known locally by the Canadian name of La Biche, meaning Red-deer or Elk River) and the Peace River (also called "Des Castors" or Beaver River). The junction of these two forms the noble stream which, after connecting the Athabasca and Great Slave Lakes, takes the name of the Mackenzie. Its Indian names, which it preserves throughout its whole course, are "Dès-nézé" or Great River, and "Na-otcha-Kotchô" or River with giant banks. The lakes are the Athabasca (the "Lake of the Hills" of Hearne) and the Great Slave Lake (in Chipewyan, "Lake of the Crees").

To the chief topographical features of this district, I propose to add my own observations on the nature of the soil and its products, statistics of the population, and some historical speculations, and I shall follow in these the natural direction of the waters, from south-west to north-east.

I.

The most southern source of the Athabasca river is in the Rocky Mountains, in a little lake at the foot of Mount Brown, 16,000 feet high,

northern boundary of the district, which is to be the 32nd correction line of the Dominion Lands township system, and is very nearly on the 60th parallel of north latitude; westward by the Province of British Columbia." This district is of larger area than Great Britain and Ireland.

not far from the sources of the Saskatchewan, Fraser, and Columbia rivers, and a little south of the Yellow Head Pass. I do not know the exact length of the Athabasca from its source, but it cannot be less than 500 or 600 miles. There are 240 miles of its Slave River course from Fort Chipewyan to Fort Resolution on the Great Slave Lake, and the Mackenzie is reckoned as 1045 miles; this would give nearly 2000 miles for the entire river system.

From its source to the confluence of the Clear-water ("Washé-Kamaw" in the Cree dialect, but more commonly called "Sipisis" or Little River) the general direction of the Athabasca is from south-west to north-east; from that point, after two very abrupt angles to the east and south-east, it goes almost straight north to the Athabasca Lake.

For my purpose, we are only interested in the river after its receiving the drainage of the Lesser Slave Lake, at which point it enters the district of Athabasca. Before that point it receives five small rivers, the Miette, Bonhomme, Baptiste, Macleod, and Pembina. This last name, or rather "Nipi-mina," is a Cree word for elk-berries (the fruit of a guelder rose, *Viburnum edule*, which grows there).

I should observe that the name Elk River, applied to the Athabasca, is not only unknown in the north-west, even to British settlers, but is incorrect, since it refers to the elk (moose) or "original" (*Alces americanus*), whilst the Athabasca bears the name of the "cerf bossu" of Canada (the wapiti),* called "biche" by the Canadians (the name of the female). The Crees call the wapiti "Wawaskisieu," and the Chipewyans "Thé-zil," or Reindeer of the Rocks, both tribes also applying these names to the great water system of which I am treating, and which should therefore be called the Great Red-deer River.

A little below the outlet of the drainage of the Lesser Slave Lake, the Athabasca receives the waters of another river, also called La Biche, which drains the pretty lake of the same name. Still lower, on the right bank, are the confluences of the Crying River ("Kitou Sipi") and Wide River ("Kaministi Kwéya"), and on the left bank the Pelican River ("Tsatsakin Sipi"), and Lake Wabasca. The right bank also receives the Houses River ("Waskaigan Sipi"); then, before reaching the turbulent cascades and foaming sheets called the Great Rapid, the right bank is again broken by the "Miyotinaw," and the left by the "Nistaukam" (Mustuch or Bison River), whilst another Red-deer or La Biche River, at least the sixth of the name in the district, also enters the Rapid on the left bank.

The large Clear-water river affluent is called "Otthap-dès," or River of the Groves, by the Chipewyans, and "Little Athabasca" by the Canadians. Inclosed between sandy banks 400 feet high, which it washes and eats away, revealing base rocks of the most picturesque character conceivable, this fresh and limpid stream is literally buried

* It is a common error in North America to call the wapiti by the name of elk.

under the natural bowers of vegetation following its shores and climbing the walls of its cañon. Nowhere have I seen more pleasing views, more crystal and yet impetuous waters, more turbulent rapids and cascades, or more shady and varied woods. Its bed is covered with fresh-water mussels (*Unio*), which, however, the Indians do not eat, and its forests contain moose and bear. A pretty spring of sulphurous and saline waters rises from five different sources in the prairie near the river, and could be made the site of an excellent sanitary bathing establishment.

A trading post called The Forks is situated at the junction of the Clear-water with the Athabasca.

Beyond the Clear-water, the latter receives on its right bank the Saline and Pierre-à-Calumets rivers, and on its left bank the Beaver, Red, and Cypress rivers.

The sandy banks of the Athabasca vary from 200 to 400 feet in elevation, and present many formations, all apparently belonging to the transitional epoch.

Below the drainage of Lake La Biche and Wide River, on the left bank, a red-coloured exposure of the schistose and oblique stratifications which dip into the muddy current suggests the action of ancient subterranean fires, called "Boucanes" by the Canadians. Here are found sulphates of iron and magnesia, nitrous deposits, and native carbonate of soda. In one place along the miry bank, a number of jets of hot steam find a vent through the mud, and make the waters of the river bubble. These traces of plutonic action are then transferred to the right bank, both above and below the confluence of the Clear-water, where there is a chain of volcanoes on a small scale, in the form of little cones of whitened and scorified earth. Beyond these places, indications of active and extinct igneous action are only found on the right bank of the Athabasca and Mackenzie system, reappearing all along this immense fluvial artery with an intermittent activity and inaction difficult to explain. In some places these "Boucanes," after having vented fire and smoke for decades, entirely disappear, only to show themselves without apparent cause elsewhere.

Traces of the subterranean bituminous veins that keep up these fires can be followed to the shores of the Arctic Ocean, in the cliffs of Franklin Bay and Cape Bathurst, where Sir John Richardson took them to be active volcanoes.

These "Boucanes" are usually found on the line of imperfect coal, i. e. of deposits of lignite incompletely carbonised, and consequently unfit for the forge or fuel. They are so along the Boucanes River, one of the affluents of the Peace River, as well as above Fort Norman on the Lower Mackenzie; but here there is no outer trace of coal or lignite, though it is probable that there are subterranean veins of those substances, and that the phenomena mentioned are owing to the protocarbonated hydrogen of the coal deposits. Nevertheless (although fire-damp explodes on con-

tact with oxygen, as is often found at the beginning of winter in some of the lakes of the north-west), the capability of spontaneous illumination which Richardson attributes to the identical exhalations of Fort Norman, has not been found to exist in this gas. It is impossible to attribute to the Indians the extinction of the fires of bituminous schists in the Athabasca-Mackenzie system. Their ignition is intermittent, without apparent cause, and unstable. It is, moreover, accompanied by a strong smell of petroleum, whilst hydrogen is inodorous. But the carburets of hydrogen, of which petroleum is composed, do not make it, any more than they do fire-damp, spontaneously inflammable, even on contact with air,—in spite of received scientific opinion. We must, therefore, consider them as one of the effects of igneous action, materially connected with the fire of the volcanoes; for the Boucanes occur under similar conditions to the vents of these subterranean fires, being found on the river banks, on intermediary strata inclosing schist, bitumen, lignites, thermal sulphurous or saline waters, rock-salt, &c.

I have observed a saline spring near the confluence of the Clear-water; a little below this point the Athabasca receives a saline feeder, which rises in a natural salt spring of considerable size; and below Lake Athabasca, on the left bank, is a second saline feeder, rising in the Caribou Mountains, which contain vast deposits of rock-salt and a cavern remarkable for its crystalline concretions.

Still further, between Forts Simpson and Norman, two other saline streams, unfit for drink, are fed by the mines of rock-salt contained in Clarke's Rock, a mountain of volcanic aspect. Lastly, there is a fifth saline river not far from the Arctic Ocean.

About 56° 30' N. lat., the Athabasca meets Birch or Bark Mountain, a continuation of the heights forming Portage-la-Loche or Methy Portage (named after the Loche or fresh-water cod-fish), and leaves its former course in order to open a way across the ravines of the mountain, thus making a right-angled elbow to the east. This wonderful cañon is called the Great Rapid. For some 25 to 28 leagues it impedes and much endangers the navigation of the Athabasca. Besides the Great Rapid, properly so called, the traveller must pass as best he may the Brûlé, Noyé, Pas-de-bout, Croche (or Sinuous), Stony, Cascade, and Mountain rapids. In short, the whole make one continuous rapid, twice as long as that of the Bear River, for the current sometimes reaches a pace of 12 to 15 miles an hour.

There is, nevertheless, strictly speaking, no cataract in the Athabasca cañon, only a very strong declivity, in the form of a rapid flat sheet of water, obstructed by enormous boulders. At its commencement the river finds itself checked by the vast natural dam of Bark Mountain, the base of which is sandstone or madreporeiferous limestone. The raging flood dashes against this obstacle, in which it has striven to batter a breach for centuries, washing away and carrying off the quartzose

particles and exposing the madreporic conglomerate, shelly limestone, or bituminous sandstone forming the base of this vast deposit, and detaching and isolating a multitude of globular masses of solid or hollow sandstone contained in the quartzose sand, which now obstruct the bed of the river and are the cause of its foaming rapids. These concretions are found at every elevation of the cliffs, from the size of a coat button to that of a Dutch fishing vessel; they are of all degrees of measurement and bulk, and of elegant or grotesque shapes, from buttons and turnips to the planet Saturn with its rings.

I have never seen in any geological text-book an explanation of the formation of these lenticular concretions, geodes, or pisolites, which I cannot believe to be merely concretions of sandstone rolled and rounded by the action of water. I am inclined to the opinion that they are masses thrown up in a globular form by some subterranean igneous force, and falling into water holding much mud in solution, in which they have passed from a pasty condition to a solid consistency, crystallising as it were in it by the action of cold. I adopt this view, because these pisolites (whether geodes or not) are only met with in this district near rapids and waterfalls, in localities exhibiting numerous traces of subterranean fires, formerly much more active and powerful than now; and because I have found some of these concretions composed of iron pyrites, crystallising from the centre outwards, and also others of bog iron. Whatever may be the method of formation of such singular freaks of nature, the Athabasca in eroding a tortuous and deep channel through the sandstone of Bark Mountain, finds its bed obstructed by these gigantic concretions, which are the sole cause of its rapids and render its navigation so perilous as to be well-nigh impossible. Besides this danger, great numbers of them are exposed on the sandy surface at all heights of the cliffs, forming immense caps constantly threatening the heads of the unsuspecting travellers beneath.

Remarkable vegetable fossils are often found in the sandstone of this part of the Athabasca, imbedded in the rock but capable of detachment with the hammer. I have noticed whole trunks of *Cupressoxylon* (probably a *Sequoia*), characteristic of the tertiaries, and have sent specimens of it to Montreal and Paris.

Near the Clear-water, pudding-stone begins to appear in horizontal layers from the level of the water, probably also reaching below it. This conglomerate is here overlaid by oblique stratifications of bituminous schist, which transude asphalt from top to bottom. The savannas and swamps covering the surface of these rocks conceal rich mines of bitumen under their thin coat of turf; and from Point Colbert to the Pierre-a-Calumets river they have given rise to the Chipewyan name of "Ellel' Dessé," or "River of the moving grounds."

The proximity of pisolites and considerable deposits of quartzose sand leads me to the belief that the bituminous matter exuding from

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the black cliffs of the Athabasca is *Piasphaltum reniferum*, characteristic of the tertiaries. It flows in summer in wide sheets from the schistose flanks of the cliffs down into the river, mixing with the sands and solidifying so as to form a conglomerate sometimes softened by the sun's rays and at others hard and brittle, of which fragments detached by the waters are carried down and deposited on the shores of the Athabasca-Mackenzie system, where they could be mistaken for nodules of basalt. They acquire an astonishing degree of hardness, and it is only by accident that their true origin is eventually discovered.

The bituminous schists are replaced at intervals by a shell-bearing limestone of dolomitic tendency, sometimes milky white. From this I have extracted various fossils, including *Terebratula*, very small Belemnites, *Atrypa reticularis*, *Cyrtina hamiltonensis*, and *C. umbraculosa*. These limestone strata are undulating, and occur both above and below the water-level.

The shores of the Athabasca present an attractive sight. Far from injuring plant life, the presence of naphtha and the subterranean fires seem to have imparted new vigour to it, so that the lofty banks have their steep slopes covered with vigorous and varied vegetation. Besides white pine, larch, aspen, and birch (which gives its name to the Bark Mountain), the forest trees here include Virginian pine, cypress, Banks's pine, Weymouth pine, balsam-poplar, alder, and many kinds of willow.

Along its waters, discoloured by muddy matter and loaded with deposits to such an extent as to be prejudicial to fish-life, I have collected a large number of medicinal plants: *Geum strictum* and *rivale*, *Verbascum*, *Eleagnus argentea* (a very sweet-smelling shrub whose berries are a great delicacy to bears), *Lonicera parviflora*, *Cypripedium* with its large golden lips, saxifrages, *Polygala*, *Erythronium dens-canis*, and beautiful scarlet lilies, like the Martagon, which would be an ornament to any garden. The Indians are very fond of the bulbs of this latter plant, which the Tinney* call "Télé-nuié" (or Crane bread) and the Crees "Okitsanak." The eatable *Hedysarum* with blue flowers and the poisonous one with yellow (known as the Travelling Vetch) are found there also. The male fern adorns the woods with its large fronds, and others, such as *Polypodium*, Capillary, and *Scelopendria*, carpet the mossy rocks with their elegant plumes. But the most abundant plant all along the river is sarsaparilla. The Tinney of the Beaver tribe know this smilaceous plant as a febrifuge and sudorific, and collect its roots; but they are not aware of the anti-syphilitic properties of smilacine, a tannic base contained in it, and which I have more than once pointed out to them.

It is a curious fact that I have never heard a *Cicada* in the North-west, though on two occasions (in 1876 and 1879) I satisfied myself of

* Also variously written as Tinnah, Tinnè, 'Dinnè, Dinnè, Dinè, Dinneh, Dènè, &c. (meaning "men" or "people")—the great northern or Athabaskan family of Indians.

the occurrence of those insects at the junction of the Clear-water and the Athabasca, though I only found them at that spot.

The wapiti has become rather uncommon in the forests of the Athabasca, but the moose is frequently met with there. I have never travelled along this noble river (and I have done so six times) without seeing it, sometimes as many as three individuals together. The frugivorous black bear, lynx, beaver, and otter are common. On June 23rd, 1879, I met two Cree hunters who declared that since the spring (i. e. in less than three months) they had between them killed along the river 200 beavers, 25 moose, 20 bears, and five wapiti; and I may add that from experience of the Redskins I know they are more given to diminish than to exaggerate the results of their hunting. This shows that life could still be maintained on the river if there existed inhabitants able to hunt and provision the trading posts. But from the drainage of the Lesser Slave Lake to Lake Athabasca, there are but 31 Crees and 22 Chipewyans, women and children all told.

The original mouth of the Athabasca is now distant a good day's navigation from the lake. It is shown by the simultaneous receding of both the high strands forming the bed of the river, which from this point keep widening away from each other until they disappear in the interior. A flat uniform plain follows, composed of accumulations of soil with no mixture of rock and covered by dense forest growth. The river has thus actually filled up its own ancient estuary with the material it has carried along, for no other in the world is more loaded with muddy deposits, vegetable detritus, and floating trees.

Almost immediately after this, the river divides into two arms, of which only the right-hand one retains the name of Athabasca, the left taking that of Embarras, because of the frequent bars made across it by the timber borne on its waters. Further on, the Athabasca channel is subdivided into three other branches, of which the central was the principal channel in 1879, whilst the left one, known as the Brochets (or Pike) River, rejoined the Embarras branch. But all these channels are interconnected by a multitude of creeks, not reckoned by the natives, as they are only navigable by bark canoes.

Some maps make the river Athabasca communicate with Lake Mamawi (or Mamawa), which is also represented as an expansion of one of the mouths of the Peace River; but this is a double error. Lake Mamawi (meaning in Cree, Reunion or Assemblage) receives its waters from Clear Lake, with which it communicates by a very short arm called the Hay River ("Klopè-djiéthé"); and Clear Lake itself is fed from Bark Mountain, having no connection with the Peace River. But before entering Mamawi, the waters of Clear Lake bifurcate, the left channel discharging under the name of the "Des Enfants" or Children River, into the most eastern mouth of the Peace River, called "Aux Œufs" or Egg River, which flows into Lake Athabasca.

The waters of Mamawi are also drained into the latter basin by four channels, of which the right-hand one passes direct into it, the other three eventually uniting and emptying into the eastern mouth of the Peace River, which before reaching Lake Athabasca sends out an arm towards Lake Mamawi. This quadruple channel bears the name of the Four Forks, and is the cause of the Cree name for Mamawi. Very curious tidal fluctuations result from this formation. In ordinary weather, with things in their normal condition, the above description is correct. But as the level of Lake Athabasca is materially heightened at the period of flood, the waters of its basin, or more correctly the currents of the Athabasca which cross it, flow back in the direction of the Four Forks, reaching Lake Mamawi and even Clear Lake itself, so that they connect the first with the eastern or Embarras channel of the Athabasca, and inundate all the prairie between the different mouths of that great river, forcing the Egg River to flow back to the main branch of the Peace River which joins the Great Slave River.

Such was the condition of the estuary of the Athabasca and its mouths in Franklin's time (and also in 1876); and if there are errors in the maps of that time, they are either owing to incorrect information or to misunderstanding; for I can scarcely believe that the first explorers were able to visit all these localities, considering the short time they spent in the country.

The vast marshy savanna of this delta—an ocean of tall grass, mare's-tail, *Cyperus*, reeds, and willows, intersected by numberless miry creeks always covered with water-fowl—is well called in Cree "The Herbaceous Network," which is practically the meaning of Athabasca, Ayabasca, Arabasca, and Wabasca, in the Algonquin dialects,—a name applied to the entire lake and also to the river by Europeans.

There are often not more than two or three feet of water in these creeks of the Athabasca; but sometimes the whole estuary is submerged and becomes part of the lake, still bearing on its muddy surface a flotilla of huge trees which have got locked together and materially heightened its level. I saw such a state of things in 1871 and 1876; but how different was the estuary three years after! At that time, the channels of the Athabasca were almost dry; the main current had left the central one and gone wholly to the east, and the savanna of the estuary, elevated many feet above it, was changed into an immense and perfectly firm prairie, covered with young willow copses and dotted with water-holes.* But the most remarkable thing was that the estuary of the Athabasca had entirely left this high and dry prairie, and betaken itself to a point between its old mouth and that of the Peace River, into the Rocky (or Stony) River, the drainer of the great lake. The expanse of waters between these two points had therefore vanished, and the once great bay of Lake Athabasca, so picturesque with its chains of granitic

* See Macoun, in Rep. Geol. Survey Canada, 1875-76, p. 91.

pine-clad isles, like a fleet of war-ships preparing for nautical evolutions, had wholly disappeared. Perhaps I should more correctly say that this basin of five to six leagues still existed with its rocky rim, but instead of water it contained grass; instead of resembling a vast turquoise set in a jasper border, it seemed an emerald, silver-veined. This part of the lake was also transformed into a prairie, from Bustard Island to the Rocky River, and its former islands, now surrounded by fertile land, only lacking the plough to produce splendid crops, were mere isolated elevations—landmarks destined in future ages to show that once the white fish, carp, and pike disported in places destined I hope to be improved ere long by high cultivation.

This condition of the waters endured till I left the North-west; for in 1881, Mr. R. McFarlane wrote to me that this drying-up had proved a severe calamity to the Redskins of the lake, who had hitherto derived plentiful supplies of food from the well-known fisheries of the Four Forks and Bustard Island, now of course entirely destroyed.

It seems that the four mouths of the Athabasca, the embouchure of Lake Mamawi, and the eastern (or Egg River) channel of the Peace River, retained their respective currents beneath the waters of the lake before filling it up; and when the level of the lake had become considerably heightened by their numerous interconnections, their beds remained like so many narrow rivers, which now run through the dried-up mud, far from the ancient isles, to reunite in the great outlet of the Rocky River.

Unless some extraordinary flood remodels this newly formed estuary, the Athabasca district will thus have gained an immense space of land, excellent for cultivation, and not requiring artificial fertilisation for very many years; and it should be noted that the climate of the lake is far from being an obstacle to the ripening of cereals and vegetables, for at the Philadelphia Centennial Exhibition in 1876, the Catholic Mission near Fort Chipewyan obtained a silver medal and honourable mention for cereals of the first quality and remarkable size. In fact, the chief want of the lake district as regards colonisation is vegetable mould. With the exception of the estuary above mentioned, and of the still more extensive and no less extraordinary one of the Peace River, only rocks are found in it; and it may be said with truth that the entire north from the Slave Lake and River to Hudson's Bay is only a gigantic bed of crystalline rocks, where the planetary nucleus is exposed under the form of various granites, felspar, syenite, porphyry, serpentine, &c. Vegetation is only to be seen in the inequalities of the stony surface or depressions in these products of fusion, where the action of water has not entirely cleared away their sandy surface, or where it has deposited a slight layer of sedimentary earth, as at the Chipewyan Mission. Conifers, black alder, heather, *Cistus*, *Absinthium*, and some other aromatic plants root in the meagre

soil, and diminish the melancholy aspect of this vast exposed portion of the frame of nature.

I firmly believe that all the ground reclaimed from the Peace and Athabasca rivers is of the best quality, if the present conditions are maintained. But there is always the fear of some exceptional rise in the waters causing a sudden flood, of such a nature that the vast plains recently uncovered might be once more overrun by devastating currents washing away their soil and entirely re-modifying their surface.

I have travelled over the whole of the estuary of the Peace River* above referred to, and found it no less curious than that of the Athabasca. As before mentioned, its first or most eastern channel enters Lake Athabasca at the Four Forks, under the name of Egg River; and the maps are quite wrong in representing the Clear Lake River as another mouth of the Peace River. But between the Egg River and the Canard or Duck Portage, where there are unmistakable traces of an old western channel, this river has four other openings into the Slave River, without counting six creeks, originating in the same number of lakes formed by the overflow of the Peace River, but with no currents of their own directly its waters retire. Between the two last-named points, therefore, there is an immense plain, comparable in fertility with the delta of the Camargue in Provence, intersected by rivulets, and dotted with lakes and ponds. Forest trees have sprung up in it, and pine-crowned hillocks rising in a hundred different places show the position of former islands. Crops of the highest quality could be raised on this gigantic and well-watered delta, which contains prodigious quantities of timber deposited by the waters during past ages. I am firmly of opinion that the colonisation and cultivation of this portion of the Athabasca district deserve serious attention, and I have therefore done my best to prepare a map of those two great estuaries as accurately as possible, preserving the local names of the lakes and water-ways. This map is, indeed, the chief result of my labours.

Besides these vast deltas there are other lands, on the left bank of the Slave River, perfectly fit for cultivation; this is indeed proved by the old settlement of the Beaulieu family on the banks of the Salt River; but the settler there would have to struggle against inextricable forests, and an entire want of roads or other communications, without mentioning other serious inconveniences.

But there is in the Athabasca district a belt not overrun by forest, and which has nothing to fear from periodical inundations; where timber only grows sufficiently for the needs of colonists, and is rarely a mechanical obstacle; well covered with undergrowth and grass, capable of cultivation, crossed by a waggon track, watered by streams, stocked with fish-bearing lakes, and offering every facility and advantage for

* On the Peace River district, see also Dawson, in Rep. Geol. Survey Canada, 1879-80, (B) p. 66 *et seq.*

the construction of a railroad. I refer to the zone of natural prairie along the Rocky Mountains, from the mountains of the Upper Saskatchewan to the banks of the Hay River, one of the feeders of the Great Slave Lake. I have been told by very many persons who have travelled over the Great Prairie, by which name this fertile belt is known, that it comprises every condition requisite for settlement, as well as being rich in lumber requisites and minerals of all kinds. Sulphur, bitumen, and coal crop up in many places, with rock-salt, iron, native copper, and even gold (according to report). Against these advantages, must be set the fact that the means of subsistence have become more and more rare, from the rapid diminution and imminent extinction of the animals which supplied the daily food of the Indians, such as the moose, caribou, wapiti, bison of the woods (a distinct species from the musk-ox and prairie bison), beaver, porcupine, &c. The musk-rat alone seems not to have failed as yet, and continues as before to swarm on the lakes, ponds, and smallest streams. I can only regret that I have no personal knowledge of this fertile region.

II.

Lake Athabasca is the smallest of the fresh-water seas which stretch like a chain from the Gulf of St. Lawrence to the Arctic Ocean, east of the Mississippi, the Red River of the North, and the Athabasca-Mackenzie system.

It is 230 miles long by 20 miles broad, and about 600 feet above the level of the Arctic Ocean, according to the observations of General Sir J. H. Lefroy. The position of Fort Chipewyan, the headquarters of the district, is $58^{\circ} 43' N.$ lat., and $111^{\circ} 18' 32'' W.$ long.; that of Fort Fond-du-Lac is $59^{\circ} 20' N.$ lat. and $107^{\circ} 25' W.$ long.

Like a number of other lakes in this region, it is a crystal sheet of water lying in a deep bed, granitic at the north end, and with sandy and muddy deposits at the south. Three of its sides are granite, and a great number of granite islands thickly set with pines dot its surface. But there are no mountains there, and Hearne, the first explorer in 1771, would have been more correct in naming it Lake of the Isles than Lake of the Hills, as the abundance of islands strikes the traveller at the first glance.

I have already explained the Cree meaning of Athabasca. The present inhabitants, the Chipewyan Tinney, call it "Yétapè-t'ué" (Lake Superior), or more habitually "Kkpay-t'èlè-Kkè," or Willow-bed, alluding doubtless to the deltas. This was also the name of an old trading fort at the mouth of the Athabasca river, where willows were the dominant feature of the vegetation, only conifers and aspens being to be seen elsewhere.

The nature of the soil of the lake is therefore identical with that of the great lakes tributary to Hudson's Bay, such as Lakes Wollaston,

Caribou, Beaver, and Bear Lakes, the Lake of the Woods, and Lake Winnipeg, and of those which drain to the Atlantic, such as the Canadian lakes proper.

The fishes of the lake are *Coregonus lucidus* or white fish, salmon trout (which there, as in more northern waters, reaches 35 lbs. and over), Canadian trout, *Catostomus reticulatus*, Maskinongé (*Esox estor*), grey and red sucking-carps, Sandro (*Lucioperca americana*, called Dorey by the Canadians), the golden-eyed Lakèche, lamprey, Methy (*Lota maculosa*), &c. I only refer here to the larger species, for the very sufficient reason that the smaller ones are entirely unknown.

The north of the lake, which is wholly sterile and rocky, only affords support for caribou, which find a palatable food in various lichens growing there. The animals and plants of the forests and prairies to the south have already been referred to.

It is obviously impossible that very exact cartographic representations should exist of so vast a lake, which has only once or twice been visited by scientific observers, and then only partially, having never been explored as a whole. I have therefore here also to make some alterations in the maps now current. It would, however, be wearisome to enter into a minutely detailed description of all the bays, isles, and capes, for which the map accompanying the present paper must be consulted.

The lake receives eleven watercourses, of which eight (the Peace, Mamawi, Athabasca, Little Fork, William's, Unknown, Beaver, and Other-side rivers) are on its south. The Grease and Carp rivers enter into it from the Barren Grounds; and the Great Fond-du-Lac river flows in on the east. The latter drains into the lake the waters of the Great Black Lake and the Lake of the Isles, a basin dotted with granitic blocks and fed by two streams which are practically a chain of small lakes. The most southerly of these rises at the foot of Beasts Mountain, not far from Wollaston or Great Hatchet Lake; the northern one rises near Lake Caribou, but without having any kind of communication with it.

It was doubtless the proximity of these two great lakes to the most eastern sources of Lake Athabasca that caused Hearne to believe that Lake Wollaston was connected with Hudson's Bay by the Churchill river, and with the Arctic Ocean by Lake Athabasca. Nothing, however, could be more incorrect. The most northern source of Lake Wollaston is the glacial river springing from the elongated granitic water-parting before mentioned. This lake drains into Lake Caribou by the Canoe River, a simple connecting arm, and communicates with the Churchill River by the Deer River. But there is absolutely no communication between the lakes occupying the two slopes of the water-parting.

I have therefore corrected four geographical mistakes about these Canadian lakes, to which various drainages have hitherto been attributed. The first mistake refers to Lake La Ronge, which empties into

the Churchill, and which was also said to open into the Beaver River; but I showed in 1873 that the Beaver receives the La Plonge River, which rises near Lake La Ronge, though not taking the actual waters of the latter lake. The second concerns Lake Wollaston and Athabasca, as above stated. The third refers to the Great Bear Lake, to which Sir John Richardson attributed three outlets, viz. the Bear Lake River and the Hareskin River, entering the Mackenzie, and the Beghula River, entering the Arctic Ocean. In ascending these three rivers to their respective sources, I proved in 1869-70 that the Bear Lake has only one outlet, viz. the river of the same name; that the Hareskin river flows out of the Wind Lake near Smith Bay in Bear Lake; and that the Anderson (the "Beghula" of Richardson) rises in a little lake at the foot of Mount "Ti-dépay" quite to the north of and some distance from Bear Lake. Lastly, the fourth error is regarding the famous great lake of the Eskimo, to which various openings into the Arctic Ocean were attributed, besides one outlet in the mouths of the Mackenzie and another in the Anderson River. It is now known that this lake (the size of which has been considerably diminished) has but one outlet, the river "Natowdjia," a direct tributary of the Arctic Ocean.

I have also, in 1879, made a complete survey of the course of the Slave River from the great lake of the same name to that of Athabasca, in order to complete my former work on the Mackenzie; and it is remarkable that, although I had no map to refer to, and no other instrument than a compass, the result agreed almost exactly with Franklin's route-map of 1820, except as regards some islands which either escaped his observation or have been exposed since his journey, some winter portages that he never crossed, and a few bends in the river which he probably passed at night-time.

Above the rapids formed by the Caribou range, where that range leaves the left bank and turns off towards the east, along the course of the great Des Seins River, or "Thou-bau-dessé,"* the Slave River crosses a flat plain covered with inextricable forests, apparently reclaimed by degrees by the sedimentary deposits of its muddy waters. This river has no sandy shores. Its muddy banks are constantly being washed off on one side to be deposited on the other. At times they give way, and the current, precipitated with violence into the forests, opens fresh channels, whilst the old ones, obstructed by the mire and sand brought down, are filled up and transformed into a marshy savanna. The Duck Portage was formed in this way. Entering it from the north (the direction facing the current), the idea is suggested that it is a channel of the river or one of its affluents; but the traveller soon finds himself in

* This river, a southern affluent of the Great Slave Lake, is apparently represented on M. Petitot's map by the "T'al'tsan-Dessé" or Yellow Knives River. The name used in the above text seems to agree with the "Thu-wu-desseh" of the map of Back's "Narrative" (1836), which enters the Slave Lake to the east of the mouth of the Slave River.

an immense dried-up marsh, quite level, and entirely composed of black viscous mud, cracked by desiccation and covered with timber formerly deposited by the waters. Its Chipewyan name, "T'èdh d'èdh-hèlì t'uc" (Floating-wood Lake) points to its origin. There is, however, no trace of any lake; but a chain of wooded and elevated isles shows that this is the ancient bed of the Slave River, which after filling it with muddy deposits has been obstructed in its course by imbedded timber and forced to break a passage to the right by an abrupt eastern elbow. I think this alteration of course has been effected recently. It may perhaps be the outlet which I saw in course of formation in 1862, though I had then no opportunity of accurately fixing its position.

During extraordinary floods, the surplus waters of the Slave River spread over this great marsh and scour the Duck Portage, but at an epoch before the formation of the present bed, when the Duck Portage was the ordinary channel, the overflow passed to the left by another natural channel, now dry. This shows a gradual tendency of the Slave River towards the east in this district. The conditions above referred to as existing at the mouth of the Athabasca, are also shown at the mouth of this river, for the current has so clogged its bed and filled up its estuary as to be compelled to divide and make its way across the sedimentary deposits of its delta, which it cuts up into a great number of mud islands.

The first and oldest of its branches contained large and lofty islands, identical as to soil with the mainland, and wooded like it with white pines, *Populus balsamifera*, aspens, and birches whose venerable trunks show an existence of at least six or eight centuries. If a line be drawn on the right from this point to the mouth of the Des Seins River, and on the left to that of the Oxen River, a triangle or delta will be described wholly occupied by the ancient and recent mouths of the river. The latter, after dividing into three channels, is subdivided into two great median arms, of which the eastern one is called Jean's River, a corruption of the Chipewyan name "Dzan-des-tché," literally Mud-river end, or Muddy mouth. Up to this point, standing trees are found in the delta, but they are no longer coniferous, thus showing that the islands are of later formation. As the channels subdivide, vegetation decreases with them; aspens, poplars, and alders have disappeared, and only small willows, six to eight feet high, are found. Still lower down, nothing is found but reeds, bulrushes, and at last only mare's-tail (*Equisetum*), an exclusively aquatic growth entirely covered during floods.

Such are the products of the last sedimentary formations, which are not yet consolidated. Between them and the lake extends a moving bog, fluctuating with the waters, which cover it for a few inches. Any unfortunate boat running into this mud will infallibly become as firmly imbedded as the innumerable tree-trunks whose roots are horizontally exposed above its surface. Some years hence, these unsolid and un-

fathomable banks will become firm, and, aided by the accumulations and drying effects of frosts in winter, will form new islands more and more encroaching on the Slave Lake.

During the 240 miles of the course of the Slave River, it only receives two affluents, one on each bank, viz. the Dogs and the Salt rivers, the first of which is above and the second below the Rapids interrupting its navigation.

The maps of Lake Athabasca give indeed its southern affluents, but two of these, the Unknown and Beaver rivers, are not represented as being of large dimensions, nor are the lakes from which they spring shown as being within so comparatively short a distance of the lacustrine enlargement of the Churchill known as Lake Lacrosse, that passage from the latter to the tributaries of Lake Athabasca could be made by the head-waters of the Caribou river. I have thought it right to rename these two great rivers and the lakes from which they spring after Messrs. C. P. Gaudet and R. McFarlane, as a mark of my respect and gratitude.

III.

The first person entitled to honour as the explorer of Lake Athabasca, was Samuel Hearne. He discovered it in 1771, and named it "Lake of the Hills." Seven years afterwards, the North-west Company sent thither a Canadian, Joseph Frobisher, who founded the first trading-post. The Hudson's Bay Company soon followed the example of its rival, so that here, as in many other places, these two commercial bodies found themselves in competition at an early date. Nevertheless, the discoveries of Hearne, of Peter Pond in 1779, and even of Sir Alexander Mackenzie in 1789, however authentic and scientific, were apparently anticipated by the far-reaching tracks of the *Courreurs de Bois*; for when Pond reached the Great Slave Lake, the half-breed Canadian family of Beaulieu had already settled on the Salt River—one of them, named Jacques, indeed acted as interpreter for this trading officer, just as at a later date his nephew François was Sir John Franklin's hunter and interpreter.

In 1820, and again in 1829, Sir John Franklin, accompanied by Lieutenant Back and Dr. Richardson, visited Athabasca on their way to the Arctic Ocean, when commencing their explorations for the famous North-West passage. The portrait drawn by these travellers of the Chipewyan Tinney (whom they also call, though wrongly, Athabascans) is anything but a flattering one, and shows the recent change for the better in the character and disposition of these Indians. I can myself speak of as great an alteration in the Beaver Indians, who are now as gentle and inoffensive as they were thievish, shifty, and faithless twenty-five years ago. This is the natural effect of the commercial relations and religious habits acquired since that date by those child-like tribes.

The Chipewyans, without being as timid as their northern brethren, who deserved the uncomplimentary epithet of "Slaves" bestowed on them by the first explorers, are now a gentle, peaceful, and honest people, comparatively chaste and religious, though they may perhaps be accused of being a little too morose in disposition and fond of solitude. The Catholic Missionaries first visited them in 1847, and two years later settled among them. In 1866 or 1868, if I remember rightly, a clergyman of the Church of England was domiciled at Fort Chipewyan; and lastly, in 1875, the Montreal Sisters of Charity founded a school with an orphanage and hospital there. This fort has for some years been the seat of an Anglican bishop.

From the time of the historian Charlevoix, a vague acquaintance with Lake Athabasca must have existed in Canada, for he speaks of the Dog-rib Indians and the "Savans" (now called "Maskégous" [Maskigos] or swamp-dwellers), the former of whom lived at the north and north-east of the lake, while the hunting-grounds of the latter were to the east and south-east.

At this date, the Ayis-iyiniwok or Iyiniwok (Men), called by Duponceau "Killistini," by the Ojibbeways "Kinistinuwook," and by the French "Cristineaux" (also called "Klistinos" and "Knistineaux"), from which have finally been derived the names Cris, Crees, Kree, and Kri, lived on the banks of the Beaver-Churchill river, which they called Great Water (Missi-Nipi), as well as on the shores of Cross Isle Lake, Moor-hen Lake, Cold Lake, &c. In short, they occupied the country between the Savans Indians on the east and the Grandes-pagnes (also called Prairie-Crees), on the west. The Chipewyans at that time lived along the course of the Peace River, after crossing the Rocky Mountains, not having yet ventured down into the country now occupied by them between the Great Slave Lake and Frog Portage on the English River. It was in fact their primitive home in the Rocky Mountains that originated the Canadian name "Montagnais" or Highlanders for these Tinney, who now live in a flat country.

Lake Athabasca, the Slave River, and the shores of the Great Slave Lake were the exclusive territory of another tribe of Tinney, to whom the epithet of Slaves was given, from their natural timidity and cowardice. They themselves recognised two divisions, people living among the hares (or northern Tinney), and among the rabbits (meaning the Chipewyans). The latter name is applied by the Crees to the entire Tinney nation, and means "Tailed men," i.e. men clothed in tailed skins. This arose from the fact that all the Tinney, like the modern Dineh of Alaska, used to wear a fringed robe of moose or reindeer skin, ending in a long point in front and behind.

The Indians using the Algonquin tongue, such as the Crees, Savans, Grandes-pagnes, and Ojibbeways, carried on a pitiless war against the Athabaskan Tinney or Slaves, who from their natural timidity gave up their

territory to their enemies, and fell back on the Great Slave Lake, pursued by the Crees, who made a great slaughter among them. Various islands and archipelagos retain the name and the memory of these dreaded Ennas (strangers, enemies), including Dead Men's Isle, which keeps alive to this day the recollection of the defeat of the Katchô-Ottiné, subsequently called Slaves. From that time, this portion of the Tinney family never ventured south, but remained in the cold lands and swampy forests of the north, where they became split up and settled under the names of Dog-ribs, Hareskins, Highlanders, Slaves, &c. Their different tribal dialects vary but slightly *inter se*, differing much more widely from the Chipewyan.

The Killistino or Crees, established on Lake Athabasca and its tributaries and drainers, found themselves exposed to the attacks of the Chipewyan Tinney arriving from the west by the Peace River (called Amisko-Sipi or Beaver River by the Crees), thus proving that the Tinney family, or at least its northern tribes, are of later origin on the American continent than the Killini or Hillini Lléní. But, being as brave as, if not braver than, the invaders, they offered such a resistance that prisoners and slaves were made on both sides. Meanwhile the English appeared in Hudson's Bay at the mouth of the Missi-Nipi (called English River from them), and founded a factory there named Churchill, after the then Prime Minister of England. This became the medium of commerce between the coast Eskimo, the Savanois, and the Crees of the interior.

Before the Hudson's Bay Company sent Hearne to explore the interior, a Chipewyan woman named Tha-narelther (Falling Sable), was carried off by a Savanois war-party, and taken in captivity to the shore-region of Hudson's Bay. She saw with astonishment in the tents of her captors domestic utensils and arms entirely new to her, and as she at first believed them to be of native manufacture, she admired the intellectual superiority of the Killini, and determined to remain with a people so superior to herself in intelligence and cleverness. But she did not live among them long before detecting from their ways and ceaseless wanderings that they obtained these things from strangers, in exchange for peltry and provisions. This traffic puzzled the captive, but as she imagined that the original possessors of the riches bestowed upon the Savanois must be their relations or allies, she never thought of taking refuge with them and begging their protection. Only after some years of harsh captivity, did she discover that the "Agayasieu" (the Cree name for the English), who supplied the Crees and Savanois, belonged to an entirely strange race, good-natured and generous, friendly with all the aborigines, and coming from the far east to trade with them. Her mind was then soon made up. She succeeded in reaching Fort Churchill alone, and as she had learned enough of the Algonquin dialect to make herself understood by the interpreters of the fort, she was enabled to let the Hudson's Bay Company's officers know that she belonged to the great

nation of "Men" (Tinney), living far off in the west, and professing honesty and fair-behaviour like the English. She expressed her determination of returning to her own people, and begged for assistance on the way home, promising to establish friendly relations between her countrymen and the officers of the company, who, glad of the opportunity of extending the sphere of their commercial transactions, gave her a sledge and dogs, with various presents, and a safe conduct through the land of the Killini. Attracted by these presents, the Chipewyans at once undertook the long voyage from the Peace River to the mouth of the Churchill, calling the fort "Thé-yó" (stone house), and its inhabitants "Thé-yó Ottiné" (men of the stone house), a name by which the English are still known among the Tinney.

These relations continued to the time when Joseph Frobisher established Fort Chipewyan, on the shores of Lake Athabasca, in 1778, for the North-west Company, at which date there were as many as 1200 Redskins settled on the lake. But the white man brought with him the horrible disease of small-pox, till then unknown to the Americans, which made great ravages among the Tinney, and more than decimated the Crees, driven to the southern part of the lake by the warlike attitude of the Chipewyans. Influenza, an epidemic catarrhal affection attacking the tribes at regular intervals of about seven years, completed the work of the small-pox. Reduced to a very small number, the Crees ceased all hostile action against the Chipewyans, who had become their superiors both in numbers and strength; so that the possession of the lake, and indeed of the territory of Athabasca, remained with the Tinney, who permitted a few Crees and Savanais to remain among them.

From Athabasca, the Chipewyans spread north by degrees towards the shores of the Great Slave Lake, and east and north-east towards Hudson's Bay, where, having met with vast herds of wild reindeer, they settled on the Barren Grounds, living from that time in common under the names of Yellow-knives ("T'altan Ottiné"), and Caribou-eaters ("Ethen eldéli"). Such of these as remained attached to the Churchill traders, took the name of the latter and are still known to their western fellow-tribesmen as "Thé-yé Ottiné"; finally, many of them even ventured south to Lake La Biche, Cold Lake, Lake La Ronge, Cross Island, Heart Island, &c., where they bear the name of "Thi-lan Ottiné" (Men of the end of the head).

When leaving the fertile plain watered by the Peace River and its affluents, the Chipewyan Tinney were hard pressed by a tribe still more warlike than themselves, namely the Sécanais or "Thé-kké Ottiné" (Men who live on the mountains), who in their turn had come from the western slope of the Rockies, where they left tribes identical with themselves as to language and customs.

As to the Beaver Tinney, they crossed the mountains to the south and reached the plains of the Saskatchewan, where still lives a remnant

of this people, the Sarsis (in Cree, "Sarséwi") whose Black-foot name means bad (from "Sa arsey," not good).

Mearns permitted the association of some Chipewyans on his expedition to the Copper-mine River, a tributary of the Arctic Ocean, with a result that is well known, as is also the massacre committed by his followers among the Eskimo.

The Hudson's Bay Company was not long in founding a trading post on Lake Athabasca, establishing one under the name of Wedderburne on an islet near Fort Chipewyan. This remained till 1821, when the rival companies united their interests and put an end to their regrettable hostilities.

Commerce and religion have materially civilised the manners and character of the Cree, Chipewyan, and Beaver Indians inhabiting the Athabasca district. They are at present quiet, peaceable, inoffensive, and friendly to the white man, but very much diminished in numbers, the failure of animal life, and the extraordinary decrease for many years in the waters of the rivers and lakes, which has destroyed fish-life to an immense extent and driven away wild-fowl, having caused such a famine that many died of hunger and misery between 1879 and 1881. There were 900 Chipewyans and 300 Crees at Fort Chipewyan in 1862, but in 1879 I could only find 537 Chipewyans and 86 Crees, even including those living on the river Athabasca. Now there is but one single family of Crees at the lake, and the remnants of the tribe have gone away to join their fellows of the Peace River.

The same fate has befallen the Chipewyans. In their total of 500 must be reckoned those of Fort Smith, at the foot of the rapids of the Slave River, as well as those of the Salt River, and many families of the Great Slave Lake and Ox River.

In short, the Athabasca district, comprising the Peace River and parts of both the Lesser and Great Slave Lakes, now contains no more than 2268 souls, including 150 half-castes and 57 white men of various origin—English, Scotch, Irish, and French-Canadians.

The following are the exact statistics in 1879, for which I am indebted to Mr. R. McFarlane, the chief of the district:—

Forts.	Tinney.	Crees.	Half-castes.	Whites.
Chipewyan, Smith, and Small Red River, together	537	86	50	28
Fort Lac	318	..	15	2
Reed, (on Slave Lake)	300	..	25	15
Verdun, (Peace River)	234	6	15	2
MacIsaac, (Clear-water River)	31	22	10	4
Dunvegan, (Peace River) and Tattle, together	195	137	20	6
St. John, (Peace River) and D'Epinette, (Peace River) and Slave Lake, together	195	..	15	..
	1810	251	150	57

Grand total of the Athabasca district, 2268.

The following statistics of the whole Athabasca and Mackenzie Red-skin population (including women and children), were collected with great care by myself in various localities which I have visited or stayed in at different times. I have before me synoptical tables by tribes and families, including even the names of the individuals.

Great Slave Lake.

Fort Resolution, 1863-64	{ Chipewyans	245
	{ Yellow Knives	332
Fort Rae, 1864	Dog-ribs	577
		788

Mackenzie.

Providence, 1871	Slaves or Etcha-ottiné	300
Black Lake River, 1878	Etcha-ottiné	115
Hay River, 1874	"	100
Fort Simpson, 1873	"	80
Fort Norman and Franklin (Bear Lake), 1863, together	{ Slaves or Etcha-ottiné	97
	{ Dog-ribs	47
	{ Mountain Indians	43
	{ Hareskins	85
Fort Good Hope, 1867	Hareskins	272
	Dindjé or Loucheux	422
Fort Macpherson (Peel River), 1866, including La Pierre's House	{ Quarrellers, Kutchin	200
	{ Eskimo of the Anderson	250
	{ " " Mackenzie	390
		550
Forts Liard and Nelson, Liard River	{ (Not collected by myself)	
	{ Slaves	500
	Population of the Mackenzie	4214

Athabasca.

Forts Chipewyan and Smith, 1879	{ Chipewyans	537
	{ Crees	86
Fond-du-Lac, 1879	Caribou-eaters	623
Vermilion, Peace River, 1879	{ Beavers	318
	{ Crees	234
		6
Fort MacMurray, Athabasca River, 1879	{ Chipewyans	240
	{ Crees	31
		22
Fort Dunvegan, Peace River, 1879	{ Beavers and Sécanais	53
	{ Crees	195
		137
Fort St. John, Peace River, 1879, Lesser Slave Lake	Sécanais	332
		195
	Population of the Athabasca	1761
	Maximum total *	5975

* These figures may be compared with similar but less detailed statistics collected by Captain (now Sir Henry) Lefroy in 1844, and published in the Proceedings of the Canadian Institute, 1853. They were also based on the books of the Hudson's Bay Company's trading posts and the personal knowledge of its officers. The enumeration of the Tinney under various subdivisions comes to 1592 men, estimated to represent 7575 souls. To these were added, at Fort Chipewyan, Lesser Slave Lake, and Isle à la Crosse, 209 families of Crees, estimated at 1081 souls. The Indians have apparently, therefore, decreased in numbers since 1844.

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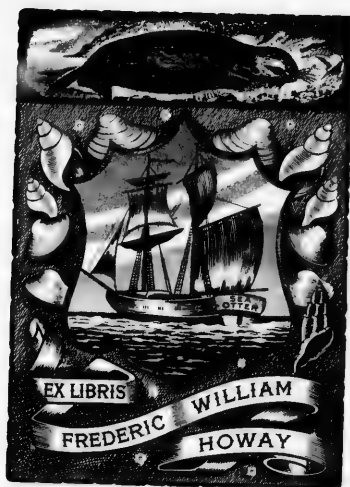
For commercial statistics, I must refer to the Hudson's Bay Company, having made it a rule in the performance of my duties as a missionary never to interfere in the least with business matters. It is of course well known that the main produce of the region consists of fur and beaver skins.

I may conclude this paper with the following table of temperatures, taken by myself at Lake Athabasca in March, April, and May 1879, from which I found that the spring there was at least quite a month in advance of that of the 66th north parallel.

Date.	Weather.	Temperatures.		Observations.
		7 A.M.	Noon.	
1879		° Fahr.	° Fahr.	
March 1	Fine	1:40		
" 2	Cloudy	1:40		
" 3	Fine	- 9:40		
" 4	"	- 7:60		
" 5	"	- 16:60		
" 6	"	- 18:40		
" 7	Snow	5	14	
" 8	Fine	- 9:40		
" 9	"	- 7:60		
" 10	Cloudy	- 4		
" 11	Fine	- 23:80		
" 12	"	- 25:60		
" 13	"	- 4		
" 14	"	- 18:40		
" 15	Thawing in sun	- 22		
" 16	"	- 9:40	14	
" 17	"	- 5:80		
" 18	Fine	- 11:20		
" 19	"	- 13		
" 20	Thawing	- 4	21:20	
" 21	Snow	6:80	24:80	
" 22	Fine	- 4		
" 23	Cloudy	6:80		
" 24	Fine	17:60	26:60	
" 25	"	14		
" 26	Windy	10:40		
" 27	"	8:60		
" 28	Fine	17:60		
" 29	"	5		
" 30	"	10:40		
" 31	"	14		
April 13*	Fine	50	..	Water running in gutters.
" 14	"	55:40		
" 15	"	59		
" 16	Snow	53:60	..	Pools of water on the lake-ice.
" 17	Fine	35:60		
" 18	Rainy	46:40		
" 19	"	35:60	..	Ice dry.
" 20	"	46:40		
" 21	Fine	35:60	53:60	Wild duck seen.

* N.B.—No record kept till the 13th. A considerable rise in temperature during the interval.

Date.	Weather.	Temperatures.		Observations.
		7 A.M.	Noon.	
1879		° Fahr.	° Fahr.	
April 22	Fine and windy	59	..	Frogs croaking.
" 23	"	42·80	..	Mosquitoes.
" 24	" Fine "	32·90	46·40	Starlings seen.
" 25	"	35·60	..	Thrushes; flies.
" 26	"	37·40	55·40	Pelican; birch-syrup making begins; edges of the lake quite free from ice.
" 27	Rainy	37·40	..	Budding.
" 28	"	32	46·40	Butterflies; swans; beetles; <i>Anemone pulsatilla</i> flowers; ploughing.
" 29	Fine	32	50	<i>Tussilago farfara</i> flowers.
" 30	"	35·60	..	Breaking-up of the lake-ice; willows bud.
May 1	Fine	50	60·80	Sowing.
" 2	"	46·40	60·80	White and grey geese seen.
" 3	Rainy	46·40	..	Water very low; lake dry; ground green.
" 4	Cloudy	50	..	
" 5	Fine	46·40	..	Penny-royal; yellow-hammers [<i>Sylvesticola astiva</i>]; gooseberry bushes showing leaves.
" 6	"	50	..	
" 7	"	46·40	..	
" 8	Windy	41	..	Ice entirely gone.
" 9	Fine	46·40	..	Cranes; white fish plentiful, but dying from want of water, and killed with sticks in the dry channels.
" 10	Cold	41		
" 11	Snow	32		
" 12	Fine	33·80		
" 13	"	35·60		
" 14	"	46·40		
" 15	"	42·80		
" 16	"	32	37·40	
" 17	"	59		
" 18	"	42·80		
" 19	Cloudy	39·20		
" 20	Fine	46·40		
" 21	"	50		
" 22	"	59		
" 23	Cold winds	42·80		



*The F. W. Howay and R. L. Reid
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